

WO 01/11702 A1

PCT/DE00/02723

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Katerini, 07 February 2004

U.S. Department of Commerce  
Commissioner for Patents  
Organization TC1700, Bldg./Room CP3  
P.O. Box 1450  
Alexandria, VA 22313-1450  
United States of America

Appl. No. 09/806,346, Conf. No. 8557, PCT/DE00/02723, Ex.: Alan Diamond

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Electrode and photoelectrochemical cell with four layers, method for producing a printable paste which is free from water and binder agents, containing carbon and electrolyte or only carbon, and electrode

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The invention refers to a procedure for manufacturing a carbon and electrolyte or only a carbon containing printable paste which is free from water and binder agents, in particular as electrode material with the necessary high conductivity in Z-direction, for a photoelectrochemical cell, a procedure for manufacturing an electrode, in particular an electrolyte containing counterelectrode of a photoelectrochemical cell, as well as to an electrolyte containing electrode and a photoelectrochemical cell.

Dye sensitized photoelectrochemical cells are well known, which do have as a semiconductor a material with a very large energy gap, like titanium dioxide. A characteristic of such a semiconductor with a large gap is that it absorbs in particular the low energy part of the sunlight to a smaller extent. The sensitivity of such photoelectrochemical cells is increased by a dye layer, which is applied to the semiconductor layer.

The functions of light absorption and charge carrier separation, which take place in the case of conventional solar cells, like for example silicon solar cells, in only one material, are separated in such dye sensitized cells. The light absorption takes place essentially in the dye sensitized layer, also called as chromophore layer, while the charge carrier separation takes place at the boundary layer semiconductor/dye.

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11/19/04